BRONCHIOLITIS
INTRODUCTION

• Most common serious LRTI needing hospital admission

• Pediatric burden of illness world wide

• Generally self limiting condition
DEFINITION

• Clinical Syndrome

• Acute onset of resp. symptoms - < 2 yrs age

• Initial symptoms – Upper Respiratory Tract viral infections

• Fever, coryza, progresses in 4-6 days to
  Lower Respiratory Tract involvement - Cough and wheezing
EPIDEMIOLOGY

• ↑ incidence due to - More premature infants & children with chronic illnesses

• More common in children < 12 months

• > 50% affected children - 2 to 7 mos. of age

• Infants < 6 months are at highest risk of clinically significant disease

• 2% to 3% of children require hospital admission

• Commonly in late autumn and early spring
INCREASING HOSPITALIZATION - PREDISPOSING FACTORS

• Infants in day care
• Exposure to passive smoke
• Crowding in the household
• Environmental and genetic factors do contribute to severity of disease
BRONCHIOLITIS - ETIOLOGY

• Viral
  – *Most common* – Respiratory syncytial virus
  – Others - Influenza, parainfluenza
    adenovirus, coronavirus,
    rhinovirus

• M. pneumonia – though isolated not recognized as etiological agent
### PATHOPHYSIOLOGY

<table>
<thead>
<tr>
<th>Sloughed epithelial cells neutrophils &amp; lymphocytes</th>
<th>Airway obstruction</th>
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</thead>
<tbody>
<tr>
<td>Complete / partial plugging of some airways</td>
<td>Atelectasis / over distention</td>
</tr>
<tr>
<td>Ventilation and perfusion imbalance</td>
<td>Hypoxemia</td>
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</tbody>
</table>

Once plugging of airway has occurred, treatment is only respiratory support, O$_2$ and time
CLINICAL FEATURES

• Quite variable
• Nasal obstruction with or without rhinorrhea
• Cough - First irritating $\rightarrow$ tight cough
• Poor feeding after the initial onset of symptoms
• Apnea unto 20% in < 12 months with RSV
• Fever - higher
RESPIRATORY DISTRESS

- Respiratory distress
  - Mild, moderate or severe
- Clinical features - Nasal flaring, tachypnea, expanded chest, audible wheeze
- Auscultation - rales or rhonchi & poor air entry, prolonged expiratory phase
- Other features - Conjunctivitis, rhinitis & otitis media
- Mild-to-moderate hypoxia - Pulse oximetry or arterial blood gases
CLINICAL CLASSIFICATION

Mild, moderate, or severe

Based on:

• Ability to feed

• Respiratory effort

• Oxygen saturation observed at admission
INVESTIGATIONS

- Complete blood count
- CXR
- Nasopharyngeal aspirate (NPA)
  
  RSV and viral culture
- Electrolytes – especially if needing IV fluids
- Blood culture – if temperature > 38.5°C
- Blood gases

**Usually no lab tests needed in mild bronchiolitis**
CXR shows -

**Hyperinflation**, patchy infiltrates – typically migratory [post-obstructive atelectasis & per bronchial cuffing]
DIAGNOSIS

• A clinical diagnosis

• Infant with short prodromal of upper RTI

• Clinical finding - audible wheezing
  - wheezing with crackles
  - respiratory distress with chest recession
DIFFERENTIAL DIAGNOSIS

- Congenital anomalies - vascular ring, congenital heart disease
- Gastroesophageal reflux
- Aspiration pneumonia
- Foreign body aspiration
MANAGEMENT PRINCIPLES

• Supportive care - mainstay of therapy

• Moderately ill infants - require supplementary. \(O_2\)

• IVF in young infants - tachypnea, partial nasal obstruction & feeding difficulties.

• Role of bronchodilators – Controversial. Can have a trial with nebulised salbutamol, Nebulised epinephrine or hypertonic saline
OXYGEN

• Humidified oxygen ideal

• Supplemental oxygen
  – if $\text{SaO}_2 < 94\%$, combination of clinically significant respiratory distress, RR > 60/min, feeding difficulty

• Maintain $\text{SaO}_2$ above 95%

• Use nasal prongs / face mask / hood / head box

• Hypoxemia + / - distress, despite high O$_2$ flow, require ventilatory support.
FLUID THERAPY

• Indications
  – Nasal flaring, tachypnea (>60/min), apneic episodes, marked retractions, tiring during feeds
• Normal maintenance volumes
  – N/2 or N/4 dextrose saline
• Fluid volumes increased up to 20%
  – if frequent or persistent fever (>38.5°C) and/or markedly increased respiratory effort
• Monitor serum electrolytes
ICU MANAGEMENT

Needed in the following category:

• Progression to severe respiratory distress, especially in at-risk group
• Apneic episodes
  – E.g. associated with desaturation
    or > 15 seconds duration
    or frequent recurrent brief episodes
• Persistent desaturation despite oxygen
• ABG evidence of respiratory failure
  – i.e. $pO_2 < 80$ mm Hg;
    $pCO_2 > 50$ mm Hg;
    $pH < 7$
CPAP

• May benefit infants with bronchiolitis by stenting open the smaller airways during all phases of respiration

• Prevents air trapping & obstructive disease
DISCHARGE

• Minimal respiratory distress
• \( \text{SaO}_2 > 90\% \) in room air
  – Except in chronic lung disease, heart disease, or other risk factors
• Not received supplemental \( \text{O}_2 \) for 10 hrs.
• Minimal or no chest recession
• Able to take oral feeds
COMPLICATIONS

• Respiratory complications - most frequent

• Infectious complications - second most common

• Cardiovascular, electrolyte imbalance
COMPLICATIONS

• Complication rates were higher in -
  – former premature infants
  – congenital heart disease
  – other congenital abnormalities

• Infants 33-35 weeks GA
  – highest complication rates
  – longer hospital stay,
  – Increased costs than other former premature infants
SERIOUS COMPLICATIONS

• Respiratory failure
• Apnea
• Pneumothorax
  – Among former premature infants
  – congenital abnormalities
• Risk of serious bacterial infections in first month of life regardless of RSV +/-
PROGNOSIS

• Generally self limiting condition
• 2% to 3% of children require hospitalization
• Need for supplemental O₂ based on SaO₂ on admission and predict length of hospital stay
• Beware of rapid deterioration in high risk group
• Death is uncommon even in high risk group
Thank You